



**US Army Corps
of Engineers®**
Rock Island District

LOCK & DAM 11 (DUBUQUE, IOWA) MISSISSIPPI RIVER

General Contractors:

Lock: Warner Construction Company, Chicago Illinois

Dam: Maxon Construction Company, Inc., Dayton, Ohio

Construction: 1934-1937

Congressional Districts: IA-1; WI-3

DESCRIPTION

Lock and Dam 11 borders on the northern edge of Dubuque, Iowa, and is 583 miles above the confluence of the Mississippi and Ohio rivers. A complex of islands and sloughs extends three-quarters of the way across the river from the Wisconsin shore. The Upper Mississippi River Wildlife and Fish Refuge occupies the land adjacent to the Wisconsin shore, both upstream and downstream from the dam.

The movable dam has 13 submersible Tainter gates (20-feet high, 60-feet long) and three submersible roller gates (20-feet high, 100-feet long). The roller gates submerge eight feet. The dam system also includes a 3,540-foot long, curved, non-overflow, earth and sand-filled dike.

The lock dimensions are 110-feet wide by 600-feet long with additional provisions for an auxiliary lock. Normal upper pool elevation is 603.0; approximately 19 feet above the tail waters below the dam at low water. The maximum lift is 11 feet with an average lift of 9.4 feet. It takes approximately 7 minutes to fill or empty the lock chamber. It takes 9 hours for water to travel from Lock and Dam 10, in Guttenberg, Iowa, to Lock and Dam 11.

HISTORY/SIGNIFICANCE

The lock opened in 1937. Dams 11 and 18 were designed concurrently, and were the first dams in the Rock Island District to employ submersible, elliptical Tainter gates. They were also the first dams in the District to use submersible roller gates.

Lock and Dam 11 was scheduled to be above Sprecht's Ferry, Iowa, but in 1933 was relocated to Dubuque. The acute unemployment in Dubuque led the government to begin construction on this complex before others of its class. During the peak of construction, the complex employed 901 people. The lock and dam elements of the complex were completed at a cost of \$7,430,000.

ANNUAL TONNAGE (10-YEAR HISTORICAL)

<u>Year</u>	<u>Tons</u>	<u>Year</u>	<u>Tons</u>
1998	20,333,245	2003	18,276,060
1999	22,504,873	2004	15,769,584
2000	20,756,882	2005	16,347,999
2001	17,340,441	2006	17,048,863
2002	20,966,149	2007	16,228,148

(MORE INFORMATION ON THE REVERSE SIDE)

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COMMODITY TONNAGE & LOCKAGES (2007)

Coal	4,038,819	<u>Subtotals:</u>	
Petroleum	485,621		
Chemicals	1,737,701	Grain	6,956,724
Crude Materials	1,765,103	Steel	157,721
Manufactured Goods	625,227		
Farm Products	7,544,198	<u>Lockages:</u>	
Manufactured Machinery	22,909		
Waste Material	1,000	Boats:	6,724
Unknown	7,570	Cuts:	4,221

CURRENT MAINTENANCE ISSUES – LOCK & DAM 11

Item (Critical Rank Order)

Repair or Replace Emergency Gates
L&D 11 Stage II Lock Rehabilitation - Major Rehabilitation
L&D 11 Stage II Lock Rehabilitation Operations & Maintenance Portion
L&D 11 Stage III Dam Rehabilitation - Major Rehabilitation
Systemic Miter Gate Replacement
Repair Roller End Shields & Seals
Central Control Station Flood Proofing
Systemic Tainter Valve Replacement
Dam Rehabilitation Evaluation Report
Replacing 70-Yr Old Lock Pontoon Barges (Work Flats)
Bridge Crane Repairs to Lattice Boom & Crane Undercarriage

TOTAL ESTIMATED COST: \$63,300,000

Breakdowns of mechanical and electrical equipment are becoming more frequent with resultant delays and loss of revenue to commercial waterway users. The electrical system presents safety concerns due to its age and insulation deterioration. The 70-year-old miter gates require extensive rehabilitation. If Lock 11 miter gates are damaged, the lock would be closed for an indefinite period until the gates are repaired or replaced. Potential unscheduled closures of 60 days have been estimated if the electrical or mechanical systems fail. Transportation impacts associated with a 60-day closure of Lock 11 would approach \$30.9 million. The improvement work is accomplished in three stages.

Stage I, Dam Scour Protection -- Involves placing additional scour protection upstream and downstream of the dam. This was completed in 2003.

Stage II, Lock -- Involves the rehabilitation of the navigation lock chamber and associated parts. Major work items include resurfacing the lock chamber, replacing the original lock machinery and electrical systems, bulkhead slots, repairing guidewall concrete, repairing Tainter valves, and bulkhead procurement. A lock closure took place the winter of 2005-2006 and the contractor completed the upper guidewall concrete repairs, installed bulkhead slots, and rehabilitated the filling and emptying system Tainter valves. Work will continue during a lock closure the winter of 2007-2008.

Stage III, Dam -- Involves the rehabilitation of the navigation dam. Major work includes the replacement of the electrical system, replacement of Tainter gate chains, repair of roller gate chains, and removal and replacement of deteriorated concrete on the dam piers. Insufficient funds to commence the Stage III design will likely delay a contract award to FY09, with construction completion in FY10.

Portions of the rehabilitation efforts are cost shared 50/50 with the Inland Waterways Trust Fund, which collects money from a barge fuel tax.

POINT OF CONTACT

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